Abstract

Title of the abstract: Descriptive study of Venom-induced consumption coagulopathy (VICC) and bedside diagnostic tests in haemotoxic snakebite (ProTIV Study).

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Objective: To describe the clinical and laboratory characteristics of Venom-induced consumption coagulopathy and to validate WBCT20 and VeMac time for bedside diagnosis of VICC.

Methods: This is a prospective observational study conducted from May 2017 to August 2018. Consecutive patients with snake bite within 24 hours with bleeding manifestations and/or positive WBCT20 and PT/INR above reference interval were recruited for the study. Variables relevant to clinical bleeding and laboratory parameters like PT/INR, APTT, Platelet count and Fibrinogen were assessed at 6, 12 and 24 hours after ASV. VeMac time (Vellore Manual activated clotting time) was performed on 37 cases and 29 snake bite controls at 0 and 6 hours after ASV along with WBCT20.

Results: A total of 37 patients were recruited. 73% of snake bites had a clinical syndrome consistent with Russell's viper envenomation with haemotoxicity and AKI and or/neurotoxicity and the remaining had pure haemotoxicity. Three profiles of VICC were identified- pure VICC in 24 patients (64.9 %), VICC with thrombocytopenia in 5(13.5 %) and VICC with thrombocytopenia and thrombotic microangiopathy in 8(21.6 %).

All the patients with VICC with thrombocytopenia/TMA had a syndrome suggestive of Russell's viper envenomation (haemotoxicity with AKI and /or neurotoxicity). All cases of pure haemotoxicity syndrome had pure VICC. There was a significant association of the VICC profile to the envenomation syndrome ($p<0.001$). 16 (43.2%) patients had major bleeding -haematuria, haemetemesis, haematochezia and malena. The average ASV requirement was 18±7. Average time required for normalization of coagulation parameters was 13±9 hours. 6 patients required product transfusion, indication being anaemia with TMA in 4 out of 6 cases. Only 1 patient had coagulopathy not responsive to ASV and blood products- refractory VICC. In the comparison of VICC-thrombocytopenia/TMA with pure VICC, those with TMA had higher rates of clinical bleeding (61.5% vs 41.7%), longer average time to normalization of PT/INR (15 hours to 12 hours), greater requirement of blood products (35.8% vs 4.2%), and longer mean duration of hospitalization (10 days vs 5 days). In cases with syndrome typical of Russell's viper, there was clinically significant bleeding despite ASV and correction of coagulation parameters. All patients had a good outcome.

We obtained a sensitivity of 93.78% and specificity of 96.55% for VeMac time of 240 seconds at admission. The sensitivity of WBCT20 for diagnosis of VICC was 81.1% (CI 64.84% to 92.04%) and specificity 89.7% (CI 72.65% to 97.81%). A sensitivity of 81.82% with specificity of 47.73% was obtained at 6 hours after ASV for VeMac time of 180 seconds. WBCT20 at 6 hours had a sensitivity of 31.8% (CI 13.9% -54.9%) and specificity 93.2% (81.3% -98.6%). Overall, the performance of VeMac time was superior to WBCT20.

Conclusion:

Bleeding diathesis of Russell's viper bite is multifactorial due to a combination of VICC, thrombocytopenia and probable endothelial injury. Clinical refractoriness to ASV therapy is probably due to the endothelial injury and closely related to the pathogenesis of TMA.

VeMac test may be a useful bedside diagnostic test for VICC.

Keywords: VICC, TMA in snake bite, VeMac time, WBCT20, Russell's viper